DESIGN OF AN ECONOMICAL, MEDICALLY-EFFECTIVE ELECTRONIC STETHOSCOPE FOR DEVELOPING COUNTRIES

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ABSTRACT

Electrical and Biomedical Engineering

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Patients with cardiovascular diseases routinely require heart auscultation for diagnoses with a high-quality stethoscope that may be relatively costly. In some rural communities of developing countries, wealth distribution is sparse, consequently limiting the number of high-quality stethoscopes for those communities. To develop an affordable, high-quality stethoscope, the results of previous studies comparing classical acoustic stethoscopes with electronic stethoscopes were used to guide the development of an economically-effective stethoscope that would be comparable to the state of the art. An attempt was made to match the technical specifications of a prototype to the specifications of a Littman electronic stethoscope, while keeping the prototype more cost-effective. The prototype design uses a bandpass filter to pass heart sounds between 100 and 240 Hz and 45 to 900 Hz, with a gain of at least -3dB and -20dB, respectively. Breath sounds were passed between 125 to 350 Hz and 50 to 2000 Hz, with a gain of at least -3dB and -20dB, respectively. 60-Hz power line interference with all of its odd harmonics were filtered out.